Quality Manual

Quasonix
6025 Schumacher Park Dr.
West Chester, OH 45069
March 27, 2019

Revision 4.10

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1 Scope

This document describes the ISO9001:2015 based Quality Management System in place at Quasonix, whose primary facility is located at 6025 Schumacher Drive, West Chester, OH. The company designs and manufactures radio telemetry products for the commercial and government sectors. A second division located in Moorpark, California is covered by a separate quality management system.

No exclusions are claimed from the standard.

2 Quality Management System Structure

2.1 The World in Which We Work (Context and Interested Parties)

The company provides telemetry products to commercial and government entities for the purpose of sending and receiving telemetry data on a wide variety of platforms (aircraft, spacecraft, etc.) These entities include **large and small government prime contractors**, both **domestic and foreign**, as well as **government defense programs, military bases and test ranges**. The marketplace is dependent on the regulations and technical standards of the **military authorities, both in the US and overseas**.

Accordingly, the company maintains contact with **individual customers** as well as groups such as the **Range Commanders Council** that set the regulations. Information from overseas is obtained through **sales representatives** who monitor conditions within their designated area. The company technical and management personnel also use **contacts** and research to understand the competitive environment and to identify shifts in the way customers are using the product or in the systems that the products become part of. This feedback is used as an input to decision making for new products and features as well as strategic alliances and mergers.

Obviously, the company is also highly dependent on reliable performance from a number of **key suppliers** for metal components, circuit cards and other items. In particular, a number of **subcontractors** are used to provide certain services throughout the company. Providing high quality products also requires a highly skilled and dedicated group of **employees** to accomplish the mission.

The management team, including those with direct outside contact and those responsible for internal design and production processes, review this information informally on a continual basis and formally periodically as part of the Quality System processes. Based on this review, decisions are made to adjust the company products and processes to be able to meet the customer requirements over the long term.

2.2 System Foundation

Quasonix has established a quality policy that includes objectives and a commitment to quality. The policy is accessible to all Quasonix employees and contractors electronically and copies are posted in various work areas. Quasonix management ensures that all responsibilities and authorities for personnel are defined and communicated within the organization. This includes ensuring that work is performed with quality in mind.

Supporting procedures and forms/records have been established to support the overall quality policy and objectives. Management and senior staff review the results of the system periodically and adjust processes and resources in an effort to continually improve customer satisfaction. Risk-based thinking, embedded throughout the system, enables the organization to determine the factors that could cause its processes and the quality management system to deviate from the planned results.

2.3 Quality Policy Statement and Objectives

The Quasonix Quality Policy statement is included as Appendix A. The policy is reviewed periodically to ensure that it continues to represent the goals of the company and is updated as needed. The statement includes clear objectives that management has determined to be the primary goals of the quality system.

2.4 Management Representative

To ensure that the functions of the quality system are maintained reliably, the company has identified the President as the Management Representative. The Management Representative is the final authority on all processes and procedures within the QMS and approves all changes. The Management Representative…

- Ensures that all processes are maintained and functioning well
- Reports to staff on the performance of processes and the overall QMS
- Is responsible for ensuring that customer requirements are understood throughout the organization
- Is responsible for ensuring that opportunities and risks to the company quality objectives are identified and addressed
- Is responsible for ensuring that opportunities to improve the effectiveness of the QMS are identified and addressed

Specific duties and tasks may be delegated as appropriate.

2.5 Quality Processes and Interaction

Quality system processes are illustrated in Figure 1 below. These processes are documented in procedures either directly within this document or separately as listed in Appendix B. The details of the inputs, function, and outputs of each process are defined within the respective procedure. All quality system procedures and forms are controlled by the Management Representative and may only be changed by the Management Representative or his/her designee. Each standalone procedure includes its own revision history.

The Quasonix Quality Management System and even the Quasonix culture are built on a foundation of personal respect and empowerment. This begins with the hiring practices that ensure that only individuals with initiative and technical competence are considered for employment. The initial criteria for being considered is that someone within the company or a trusted contact must already know your work and be able to recommend you for employment, with regard to both technical ability and team attitude.

With an employee base built around the best team players available, the company has the ability to push decisions to the best position in the organization to make the most informed choice. Management ensures that this philosophy is clearly understood throughout the company so that very little traditional management is needed. Instead, throughout the organization decisions are made based on the best choice for the company overall, with no infighting or territorial thinking common in traditional corporate organizations. Leaders are elevated by the organization based on performance, rather than being hired untested into a leadership role.

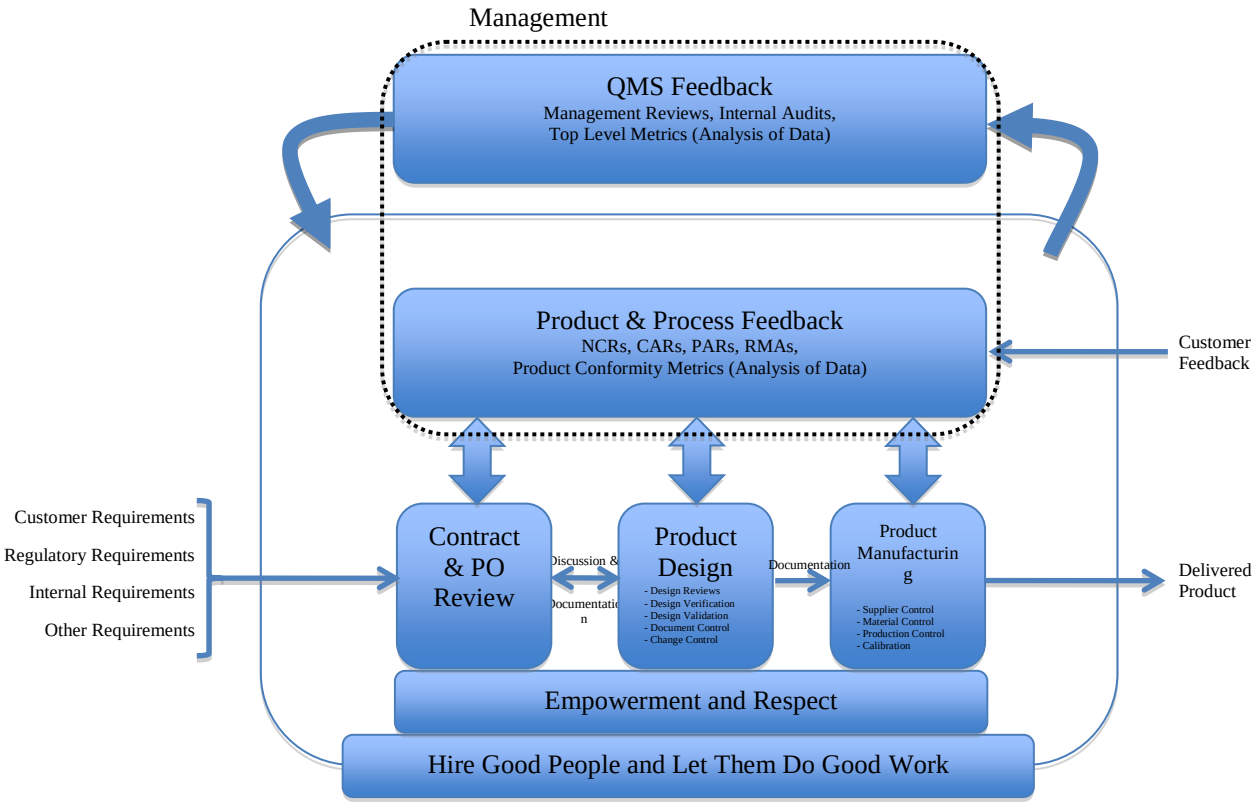


Figure 1. Interaction of Quality System Processes and Subprocesses

The result is a set of processes where problems are solved because the team collectively recognizes that a solution is needed and process improvement is driven by solutions arrived at by consensus. The founder and president of Quasonix frequently reiterates that his apparent skill in managing the company is an illusion; his *real* skill is in building the company with people who are self-managing. This thinking is embodied within the Quality Management System by way of various approaches such as self-review of certain documents, a distributed document control function and other aspects that are built around individual competence and responsibility.

3 Quality Processes

3.1 Contract Review

Quasonix reviews customer requirements prior to agreeing to supply a product, as defined in procedure SAL001. Reviews ensure the following items are considered:

a. Product or order requirements are fully defined

b. Conflicting or ambiguous requirements are resolved

c. Suppliers or subcontractors, as well as Quasonix in-house personnel, have the ability to meet the defined requirements

d. Special requirements (such as new processes or equipment) for the product or order are determined

e. Risks have been evaluated (such as new technology, component availability, or short delivery time scale) with an aim to enhance customer satisfaction

Records of the results of the review and actions arising from the review are maintained. In the event that product requirements change for any reason, Quasonix maintains records of the change and notifies appropriate stakeholders, including the customer when appropriate.

The need for an export license is identified during the initial contract review. If a license is required for the order, the License Administrator is notified. Because improper exports can cause serious harm to the company a documented procedure, SAL002, has been established to define how a license is obtained.

3.2 Product Design

The Product Design process is defined in detail in procedure ENG001.

3.2.1 Design Inputs

Design inputs may be received from customer requirements or may be formulated by company requirements independent of a specific customer request. When direction is received to initiate new design work, specifications are captured in the initial design documents in a form appropriate to the type of specification. These documents are maintained with the project files as a record to be used for verification and validation of the final design.

3.2.2 Design Reviews

Design work is reviewed at key milestones defined by the engineering team based on the scope and stage of the effort. Records of action items and their closure are maintained for all reviews.

3.2.3 Verification and Validation

All product testing is done to well defined and established test processes. To identify and address any risk that new products fall below customer expectations, new designs must meet the requirements of all applicable production tests as well as additional verification testing defined by the engineering team. Records of such testing are maintained in the production test database and in additional engineering records. All new design work is validated against the intended requirements as documented on the initial design documents.

3.2.4 Document and Data Control

Quasonix maintains its documents in a variety of formats, such as electronic, paper, and/or magnetic. Quasonix ensures, via proper training, that personnel have access to quality management system documentation, including, but not limited to, released drawings, standards, specifications, and change notices, and are aware of relevant procedures. The latest version of all Quality System documentation is found on the server at \\FILESERV\QualitySystems. Throughout the system, old versions not suitable for use are moved to ‘Archive’ folders. Management ensures that IT functions are well supported including a stable network and regular backups both on- and off-site.

The document originator controls all documentation required for product realization. Prior to release each new or revised document is stored in an area designated for in-process or non-production items. Whether for original release or revision, once documents are reviewed and approved they are moved to a general access area for use in production of customer deliverables. Documentation needed for manufacturing is available in electronic and/or hardcopy format at the point of use.

Revision tracking is applied to all documents and old revisions are suitably controlled, though the nature of the customer base requires that old revisions must be available in some cases. When this is necessary, the risk of building an incorrect configuration is removed by clearly defining the customer requirements in the purchasing and shop order documentation to ensure that the proper configuration is delivered.

Normal operation of the company does not require customer documents other than purchasing documents. If handling of customer documentation were necessary the Management Representative or a designee would work with the product line lead to ensure their proper care and dissemination.

3.3 Production Control

3.3.1 Purchasing

Quasonix ensures that purchased product conforms to specified purchase requirements. Suppliers are generally selected based on their ability to meet product specifications, delivery requirements and cost requirements, minimizing the risk of material issues on the production floor. The type and extent of control applied to the supplier and the purchased product is dependent on the effect of the purchased product on subsequent product realization or the final product.

- All COTS components to be included in customer deliverable assemblies are purchased from the Original Component Manufacturer (OCM) or from an OCM-authorized representative or distributor. No brokers or other secondary market sources are used to minimize the risk of counterfeit parts.
- Suppliers of custom metal parts are required to maintain material certifications traceable to the Quasonix purchase order and part number. These records are to be made available on request.
- All purchased items are inspected at the Receiving/Inspection department per procedure MAT001. Finding material issues early in the process minimizes the cost of correcting the issue and reduces the risk of interrupting production flow.
- Quasonix conducts quarterly supplier quality reviews, as well as a weekly review of work in process including any non-conformances for appropriate actions.
- Should it be required by contract, Quasonix has the ability to use customer-approved special process sources.
- Quasonix maintains a list of approved suppliers.

3.3.2 Product Identification and Traceability

Where appropriate, to remove the risk of building an incorrect configuration, Quasonix identifies a product using a Job Traveler or other suitable means throughout product realization as defined in procedure MAT002. Quasonix maintains the identification of the configuration of the product in order to identify any differences between the actual configuration and the agreed upon configuration. Completed Job Travelers are maintained in Shipping as a quality record for the longer of 10 years or the life of the product.

3.3.3 Process Control

The Job Traveler is the monitoring document reflecting the required process steps and is used for accountability and configuration control during all phases of production. A Job Traveler is issued for each sub-group of a split order.

Production equipment, tools, and programs are validated prior to use, as risk mitigation, and are maintained and inspected periodically.

3.3.4 Inspection and Testing

A Job Traveler identifies all inspection and testing requirements for each unit and provides for operator sign-off on all steps. Inspectors are trained to J-STD-001 and/or IPC-A-610 and use equipment with suitable magnification and lighting. Validation is performed on all new jobs and first piece validation is done on each lot. Test equipment is calibrated on a scheduled basis to remove any risk that products fail to meet the intended specifications.

Most test records are retained electronically using automated test stands. Additional testing may be done using manual test stands. All test records are retained in the production records for the longer of 5 years or the life of the product.

3.3.5 First Article Inspection

Quasonix uses a representative item from the first production run of a new part or assembly to verify that the production processes, production documentation, and tooling are capable of producing parts and assemblies that meet requirements.

This process is repeated when changes occur that invalidate the original results (for example, engineering changes, manufacturing process changes, or tooling changes). First Article inspection is updated to include any changes to product configuration or production processes. First Article inspection documentation includes:

- A list of characteristics required by the product design and required tolerances (if any)
- Actual test results

First Article inspection and test results for new designs are maintained with the production test data and associated engineering project files. First Article results to re-validate production processes are maintained in the production test results.

3.3.6 Control of Inspection, Measuring, and Test Equipment

All calibration of measuring and test equipment is outsourced to appropriate calibration service providers. To ensure that the provider is competent (risk mitigation), each provider must be certified to ISO / IEC 17025 unless they are the original manufacturer of the equipment. A schedule of calibration due dates is maintained.

- All calibrated equipment is identified by an appropriate calibration sticker.
- Non-calibrated equipment is identified as such.
- Test Software is controlled by revisions.
- No personally owned equipment is allowed.
- Customer supplied equipment is maintained and calibrated when required.

If a calibrated item is found to be out of tolerance, a Corrective Action Report (CAR) is issued and suspect product is re-inspected. Production test data allows tracing and recall of any product that may have been tested with out of tolerance equipment should that be necessary.

3.3.7 Handling, Storage, Packaging, Preservation, and Delivery

Quasonix has established rules for handling material throughout the product lifecycle including Receiving, Inventory, Production and Shipping. In particular, handling procedures are in place for Electrostatic Discharge Sensitive (ESDS) electronic components. Appropriate containers, protective equipment and training are provided to remove any risk that sensitive components could be exposed to discharges that might cause damage.

3.3.8 Control of Nonconforming Material

Quasonix has a documented procedure, MAT002, for the identification, documentation, evaluation, segregation, and disposition of nonconforming material. The procedure includes notification of concerned parties regarding a nonconforming product.

Quasonix procedures restrict the application of preliminary review to dispositions of rework, scrap, or return to supplier. Regrade is not allowed. Repaired or reworked products are reinspected in accordance with documented instructions and appropriate records are added to the Job Traveler.

Scrap product or material is conspicuously and permanently marked or separated from production material to prevent it's use in production (risk mitigation).

Quasonix promptly notifies the customer when it is discovered that a discrepant product has already been delivered. A Return Material Authorization (RMA) is issued.

3.4 Management

Company management is responsible for providing adequate resources to ensure that the quality system is operating effectively. Management is responsible for the performance of the system and assesses it at least quarterly in a Management Review where metrics for the system and for each primary process are reviewed using the dashboard form, F-15. Management has specific responsibility for the following areas.

3.4.1 Corrective Action

The Corrective Action procedure, CPA001, defines steps to be taken for Corrective Action when such a situation is identified. Key to the Feedback Process is the required Root Cause Investigation whereby the specific cause of a nonconformance is identified.

Corrective actions are initiated whenever a product design or process adjustment is needed to prevent recurrence of a situation that has created a defect. Typically, Corrective Actions are appropriate when the process change is indicated by events or conditions outside the process area, such as a product escape or an internal audit finding. The Corrective Action process is always initiated whenever a key process metric is out of bounds.

Corrective Action Reports (CARs) are issued at the direction of the Management Representative or a designee. For each situation, a CAR is completed and processed. The CAR form contains the following information:

- A traceable corrective action identifier
- Steps taken to identify the scope of the nonconformity and to contain it
- Root cause of the discrepancy or potential discrepancy
- Corrective actions to be taken to reduce or eliminate the risk of recurrence
- Verification and follow-up requirements

3.4.2 Internal Quality Assessment

Quasonix management performs ongoing assessments of all processes, procedures and records that pertain to the effectiveness of the production and quality system, with the entire system audited at least once per year. The frequency of auditing a particular area may be adjusted based on the severity of any known issues. The details of the internal audit process are defined in procedure AUD001. Management holds a formal review of the entire quality management system approximately quarterly. Records of the reviews are kept using form F-13 and are maintained on the common fileserver for a minimum of 3 years.

In addition, a weekly meeting is held to discuss upcoming work, including any factors that pose a risk to or present an opportunity to improve product quality and customer satisfaction such as recent customer feedback, audits, Corrective Actions and any other elements of the business as may be appropriate. This meeting includes the President, senior staff and others as appropriate to recent issues.

3.4.3 Qualification of Associates

Because having a team of high quality individuals is key to the way the company operates, including the operation of the quality system, Quasonix does not hire from resumes and does not advertise openings. The company uses Performance Based Hiring exclusively. When a resource need is identified, the President, with input from stakeholders, determines the necessary competence required to fill the need. Input is then solicited from throughout the company to identify candidates that Quasonix associates or trusted contacts know first-hand to have the

appropriate initiative and team oriented attitude. Candidates are then further evaluated through appropriate means, including but not limited to interviews with the relevant stakeholders. The President collects input from interviewers and any other appropriate source and makes the hiring decision. Human resources personnel maintain a permanent record of the lineage to verify the hiring history. New hires are requested, but not required, to provide resumes, transcripts and other documentation.

Periodic training is provided in certain areas that directly impact quality. For example, assemblers and inspectors are trained to J-STD-001 and/or IPC-A-610. Similarly, attendance at relevant seminars and symposia is encouraged. For individual training, the individual trainee maintains records of the training throughout their employment. When internal group training is done, human resources maintains a permanent record of the training.

Training effectiveness is determined in various ways based on the type of training. For example, the effectiveness of IPC-A-610 training is determined by informally monitoring the quality of work performed by the operator and the subsequent defect rate. The President or a designee makes a determination of the effectiveness of the training by observing the application of new knowledge to product designs or production processes. If the training is deemed ineffective, additional training may be required or, if training is effective, it may be offered to additional associates. Records of training and the evaluation of effectiveness are retained by Human Resources on form TRN001_COM.

3.4.4 Control of Quality Records

The primary quality records are listed in Appendix C of this document. The Management Representative, or a designee in the appropriate area, controls all master blank forms. Most records (completed forms) are stored electronically in a designated area of the common fileserver while some are stored in hardcopy. Retrieval of electronic records requires Microsoft Word®, Excel® or Access® or Intuit QuickBooks. Records are protected by providing limited access, where practical, or by password-controlled access.

The storage location and retention requirements for each record are defined in the procedure where the use of the form is defined. Once the retention period has passed, records may be disposed of with the permission of the person responsible for the relevant area or the Management Representative.

3.4.5 Product Returns and Customer Supplied Product

In the normal course of business, customer returned units are the only customer property handled by the company. The process for handling returned units is defined in RMA001, Customer Returns Process. Defect data from RMAs may be elevated to a Corrective Action and become an input to the feedback process.

Should it be necessary to accept other types of customer property, the President or a designee would define the specific handling procedures for the items including identification and safekeeping.

3.4.6 Continual Improvement

The quality system includes several feedback paths that identify opportunities for improvement through Corrective Actions, Internal Audits and process metrics measuring QMS performance. The overall performance of the system is assessed during Management Reviews, as described above. In addition, ideas for ways to improve the system may originate in a variety of informal ways. These ideas are collected by the Management Representative and assigned for implementation as appropriate.

3.4.7 Identification and Reduction of Risk

The key processes of the QMS have been planned and developed to include numerous steps to mitigate risk and take advantage of opportunities. Examples include Job Travelers to ensure all assembly steps are completed, the use of automated product testing and the use of in-process inspection of all assemblies, all of which reduce the risk of human error and improve quality and thereby increase customer satisfaction. Many additional steps to address risks and opportunities are identified within each procedure.

Management is always alert to identify additional steps that can be taken to address risks and opportunities and has built mechanisms into the QMS to address these as they are identified, including a formal Corrective Action process

and an Opportunities for Improvement List. These are reviewed formally on a periodic basis. Metrics are applied to each of the key processes to verify that the QMS is achieving the intended outcomes and is improving.

3.4.8 Statistical Techniques

All products are 100% inspected and tested. No statistical control methods are implemented or required at the unit level. Efforts to analyze aggregate data such as on-time delivery and overall product defect rates are in use and constantly evolving to provide feedback input to new product and process design.

4 Transition Statement

In order to facilitate the implementation of the quality system, certain elements related to the system at the inception shall be deemed “grandfathered in”. This shall include personnel, personnel competency and documentation in the existing state. Work done and resources in place prior to the initial release of this manual may lack the expected objective evidence required by the QMS.

5 Revision History

Date	Description	Approved By	Version
6/2/14	Added Revision History table	Unpublished	2.2
6/4/14	Added Training Effectiveness; Test record retention	T Hill	2.3
6/12/14	Added designee in section 3.4.2	T Hill	2.4
6/19/14	Section 2.6, added words about TRN001_COM Section 3.2.4, added file locations	T Hill	2.5
6/26/14	Updated forms table	T Hill	2.6
7/3/14	Deleted Objective 4 per Mgt Rvw AI	T Hill	2.7
7/17/14	Updated scope and policy to resolve Eagle doc review comments	T Hill	2.8
9/24/14	Removed Simco reference to allow other cal sources Removed Specification Sheets from design area	T Hill	2.9
10/2/14	Updated form numbers to F-xx format	T Hill	3.0
2/26/15	Added F-14 SO Checklist guidance	T Hill	3.1
4/22/15	Removed “Inc.” from company name	T Hill	3.2
6/5/15	Updated organization of manual to better reflect process definitions; Added some forms to App C.	T Hill	4.0
12/8/15	Added F-16 to controlled forms list.	T Hill	4.1
1/13/16	Fixed duplicate form numbers on F-16.	T Hill	4.2
2/17/16	Removed 2 yr record keeping reqt from 3.3.6 Cal’n (CAR 1074)	T Hill	4.3
2/22/16	Removed PARs; Added Context (2.1)	T Hill	4.4
9/12/16	Updated forms list; Added “:2015” per ANAB	T Hill	4.5
12/20/16	Added ‘no brokers’ and ‘material cert’ bullets in Purchasing	T Hill	4.6
9/1/17	Added notes at Rev table (CAR 1085)	T Hill	4.7
3/22/18	Added form F-20 to list; Updated scope per OFI; Clarified Management Responsibility	T Hill	4.8
11/7/18	Added highlights of risk being addressed, including section 3.4.7; Bolded interested parties in section 2.1 Added F-21; Implemented various OFIs	T Hill	4.9
3/26/19	Added IT backup words (3.2.4)	T Hill	4.10

NOTE:

1. Whenever this document is revised, send a copy to the web site coordinator for posting on the Documents – Company Background page.

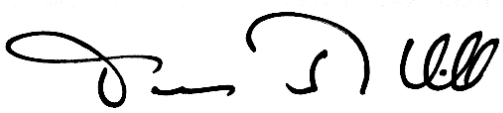
2. If revising the Quality Policy contained within this document, send it to key suppliers, as required by ISO9001:2015 clause 5.2.2 (c).

Appendix A – Quasonix Quality Policy and Objectives

Quasonix Quality Policy is to provide its customers with high quality products, on-time delivery and ever improving levels of satisfaction. Quasonix is committed to meeting the requirements of our customers as well as the ISO9001:2015 standard and to continuously improving the quality of the products we build.

This policy is accomplished through the following objectives:

1. Continuously improve the quality of the products that are delivered to our customers.
2. Ensure that we provide our customers with on-time delivery.
3. Strive for total customer satisfaction in the products and services we provide.



Terrance J. Hill
President

6 Appendix B – Quality System Procedures

The most recent revision of each procedure is that which is available in the network folder \\FILESERV\QualitySystems\Procedures

1. SAL001 Determining Customer Requirements
2. SAL002 Export License Procedure
3. ENG001 Engineering Design Process (includes Document and Data Control)
4. MAT001 Receiving Material
5. MAT002 Processing Materials (includes handling of Nonconforming Material)
6. RMA001 Product Returns
7. CPA001 Corrective Actions
8. AUD001 Internal Audits

7 Appendix C – Quality Records

The following records are part of the Quality Management System. The master version of the form (blank record) is located as listed in the table. There is no blank master for permanent records.

Form Number (if any)	Name	Blank Location
	Quote	QuickBooks
	Sales Order	QuickBooks
	Design Requirements	Engineering Design Files
F-03	Design Review Results	Engineering Design Files
	Design V&V Records	Engineering Design Files
F-06	Engineering Change Notice	\\FILESERV\Production\ECN
F-07	Engineering Change Notice Log	(Permanent)
F-12	Nonconforming Material Report	\\FILESERV\QualitySystems\Forms
F-11	Nonconforming Material Report Log	(Permanent)
F-08	Corrective Action Report	\\FILESERV\Production\Corrective_Action_Report
F-09	CAR Log	(Permanent)
	Return Material Authorization	\\FILESERV\Production\RMA
	Transmitter RMA Log	(Permanent)
	Receiver RMA Log	(Permanent)
F-05	Internal Audit Report	\\FILESERV\QualitySystems\Forms
F-16	Internal Audit Schedule	(Permanent)
F-13	Management Review Minutes	\\FILESERV\QualitySystems\Forms
F-02	Historical Hiring Tree	(Permanent)
	Competency Matrix	HR
F-01	Internal Training Record	\\FILESERV\QualitySystems\Forms
	Production Test Records	\\FILESERV\Production\Test Data
	Supplier Evaluations	MISys Report
	Calibration Records	(Permanent)
	Certificates of Conformance	Shipping
	Job Travelers	\\FILESERV\Production
	Final Inspection Checklists	\\FILESERV\QualitySystems\Forms
F-10	Stock Move Ticket	\\FILESERV\QualitySystems\Forms
F-18	Sales Order Checklist	(Permanent)
F-15	Management Review Metrics	(Permanent)
F-17	Screwdriver Check Form	(Permanent)

F-14	Production Procedure Template	\\FILESERV\QualitySystems\Forms
F-20 / F-20A	Quasonix Quality Notes	\\FILESERV\QualitySystems\Forms
F-21	Perishable Reference Data	\\FILESERV\QualitySystems\Forms